

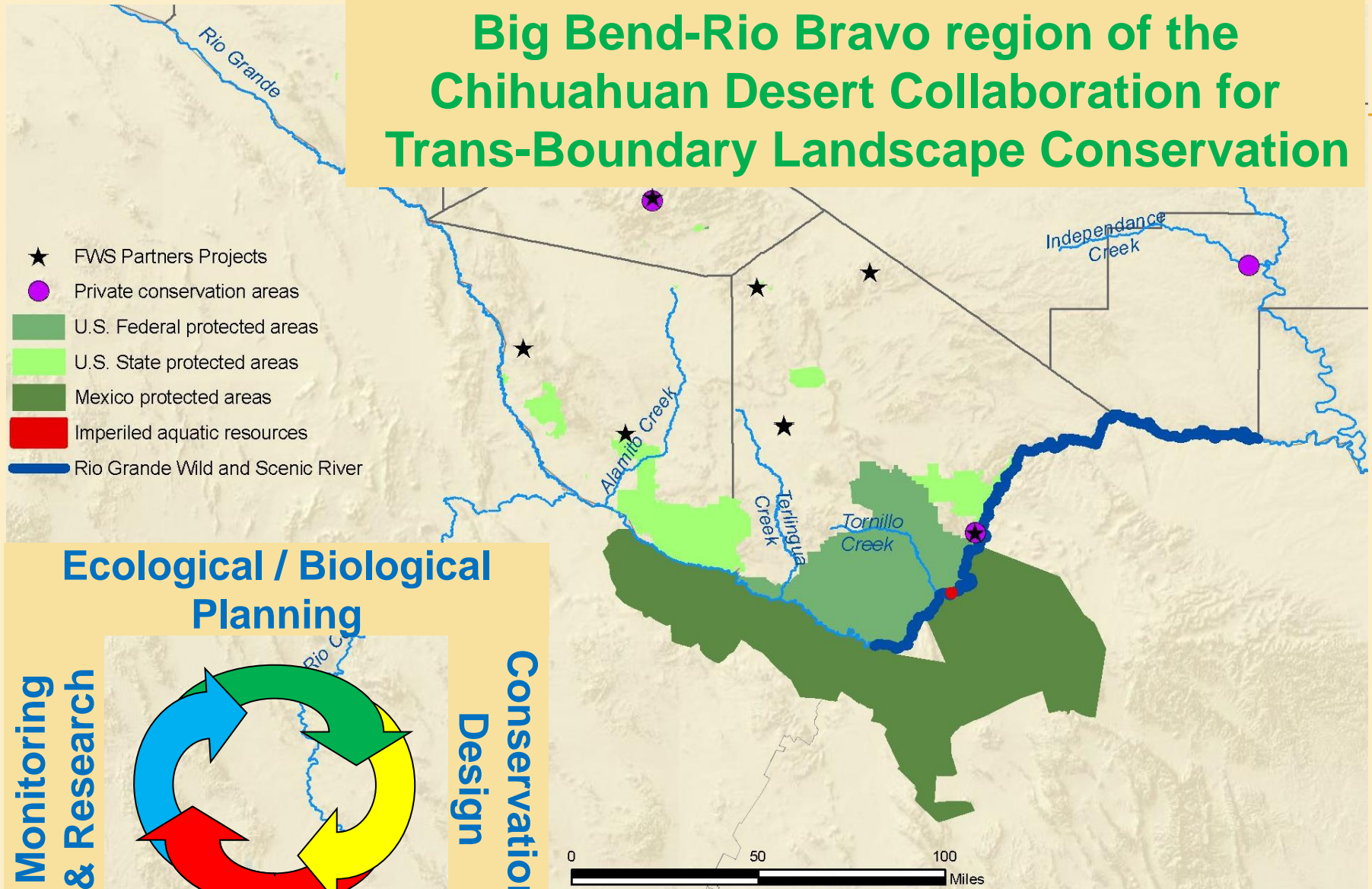
TALE OF TWO RIVERS

Better, the development of strategic conservation and restoration of two large riverine ecosystems

Rio Grande - Big Bend Area

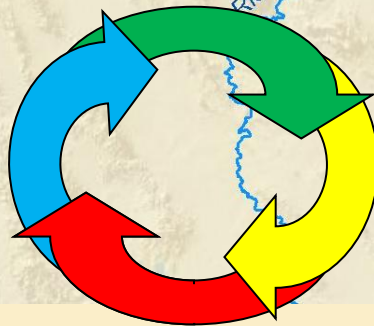
Colorado – Lower Colorado

Big Bend-Rio Bravo region of the Chihuahuan Desert Collaboration for Trans-Boundary Landscape Conservation



Ecological / Biological Planning

Monitoring
& Research



Conservation
Design

Delivery of
Conservation Actions

A strategic, trans-boundary approach to landscape conservation.

BIG BEND-RIO BRAVO PARTNERS

Over 30 partners in Mexico and the U.S.

Federal Governments:

- NPS-Big Bend National Park, Rio Grande WSR
- USFWS, USGS
- CONANP - Three Protected Areas, Monumento Rio Bravo
- Commission for Environmental Cooperation (CEC)

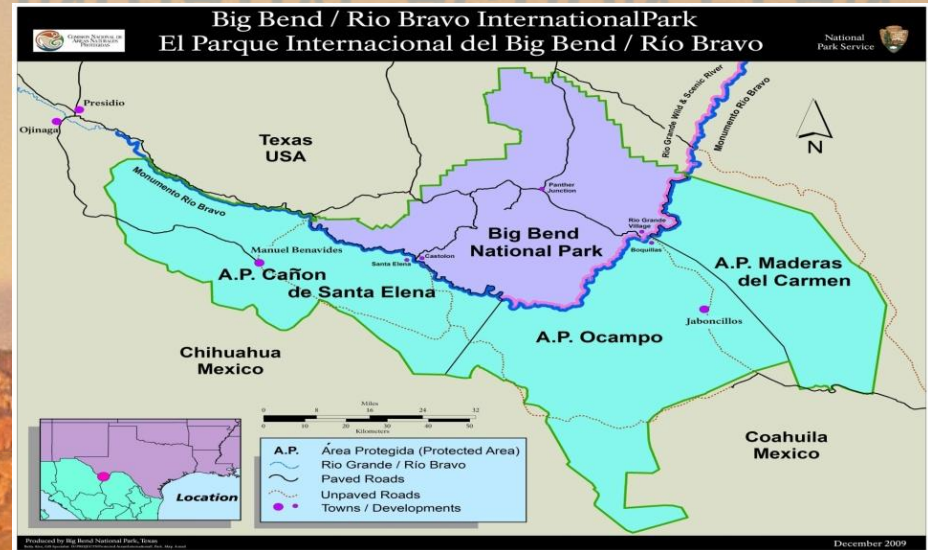
NGO and Private Partners:

- World Wildlife Fund
- Profauna
- Coca-cola

Universities:

- Utah State University
- Sul Ross State University

BIG BEND - RIO BRAVO INITIATIVE ACTION PLAN

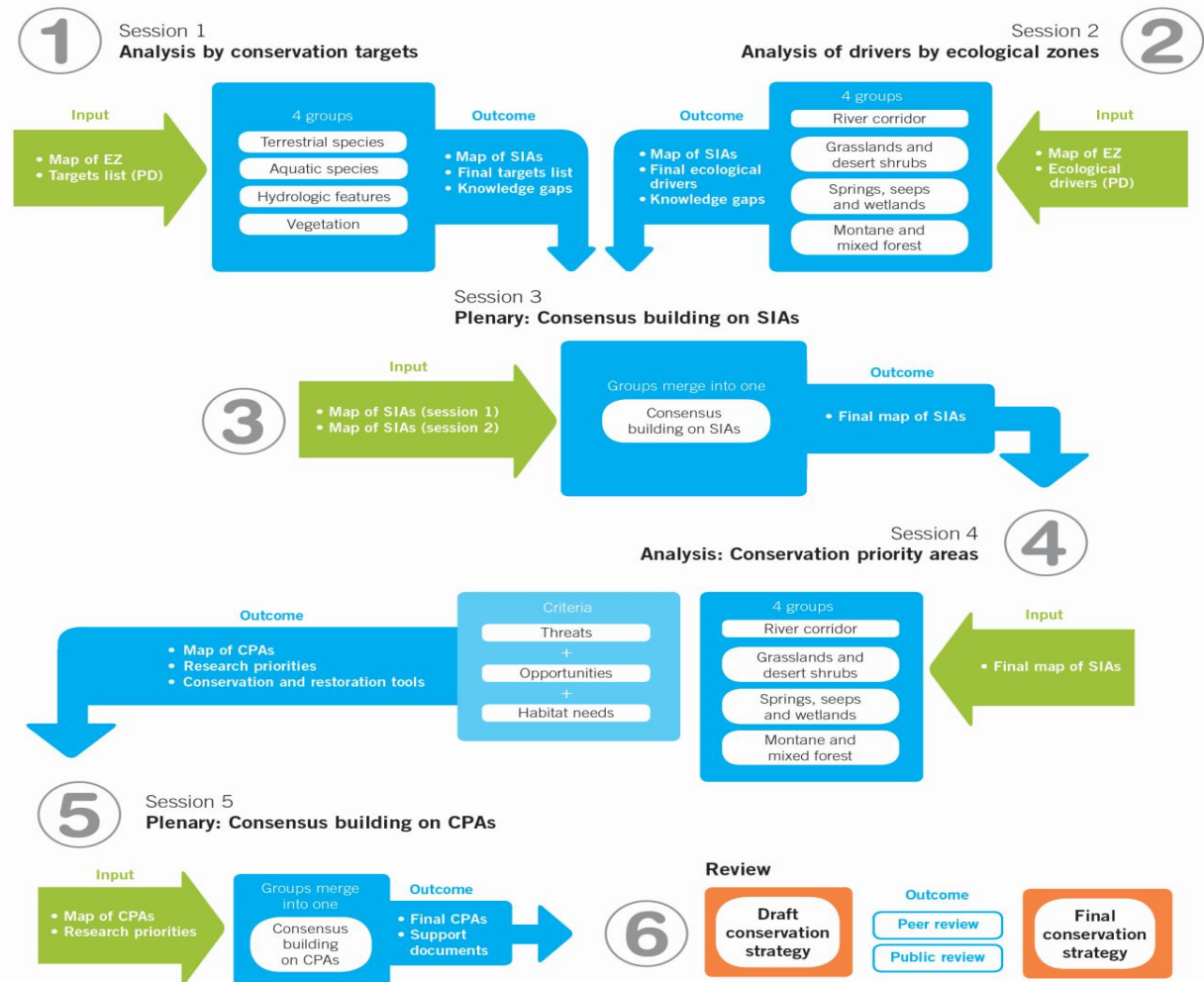


12 specific goals related to:

- ✘ Rio Grande-Río Bravo watershed conservation: main channel, tributaries, riparian, spring, and grassland habitats
- ✘ Conservation of native species and control of exotic, invasive species
- ✘ Targeted monitoring and research for conservation decisions/actions
- ✘ Assessing and managing the effects of climate change on natural resources
- ✘ Re-opening a local border crossing to facilitate transboundary conservation
- ✘ Bi-national cooperative fire management
- ✘ Engaging local communities and protected area visitors in conservation

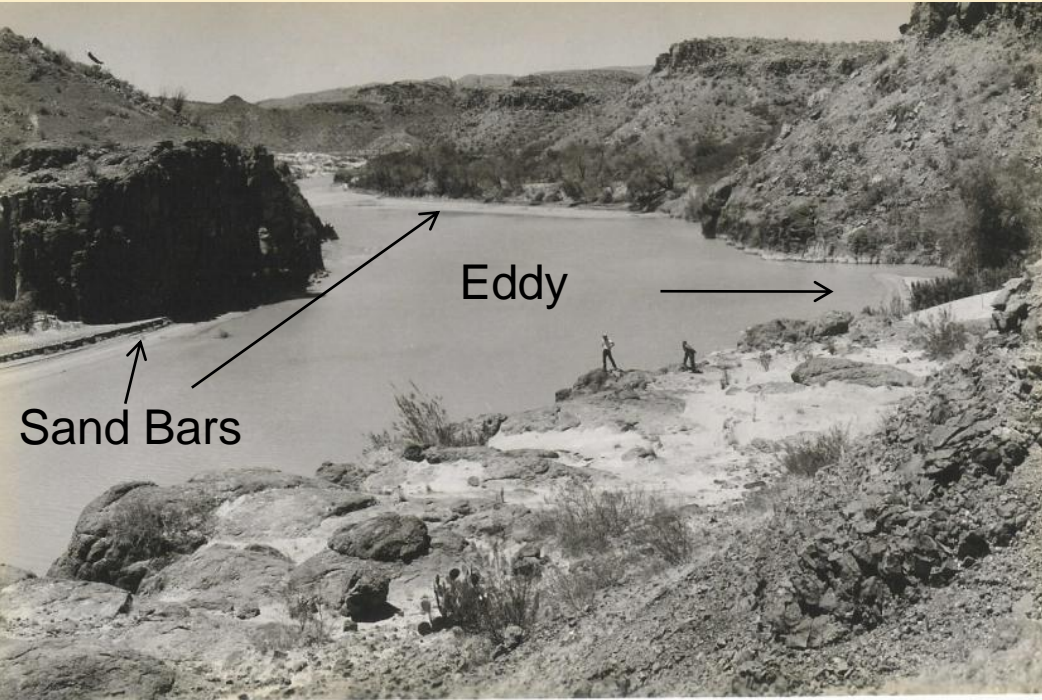
Conservation Target approach to setting metrics

Big Bend-Río Bravo Conservation strategy process



Acronyms: EZ Ecological zones; CPAs Conservation Priority Areas; PD Preparation document; SIAs Special Interest Areas

RIO GRANDE/RIO BRAVO



Sand Bars

Eddy

Reference Condition approach to metrics

1945

- ✗ Channel spans entire width of bedrock walls
- ✗ Alternating sand bars
- ✗ Active eddy

2008

- ✗ Floodplain surface inset within bedrock walls
- ✗ Steep, high banks completely colonized by tamarisk
- ✗ Eddy has filled with sediment and is colonized by giant can



REFERENCES INCLUDE CONCEPTUAL ECOSYSTEM MODELS

Regulated flows and invasive vegetation have led to channel sedimentation, loss of channel capacity, decreased diversity of aquatic habitat, degraded water quality and increased flooding frequency...

Possible solutions include:

- (1) Managing exotic riparian vegetation to reduce armoring of the banks of the river;
- (2) Environmental flows;
- (3) *Grassland restoration to reduce erosion and the sediment supply.



Flooding of the Rio Grande
September 2008

EXOTIC VEGETATION MANAGEMENT (2003 – 2012)

✦ Objectives:

- Reduce riparian vegetation density
- Evaluate ecological and morphological effects
- Increase biodiversity/improve habitat
- Increase recreational access

✦ Implementation:

- Binational saltcedar treatment developed by CONANP
- Labor provided by Boquillas citizens
- Saltcedar treatments in springs
- Large scale giant cane treatment
- Establish saltcedar biocontrol
- Quantitative monitoring of projects



UNDERSTANDING THE RIO GRANDE

- ✘ Rio Grande/Rio Bravo Geomorphology/Channel Change Studies
 - + Utah State University – 35 cross sections in 3 study reaches
 - ✘ Dave Dean's Thesis, and publications by Dean and Schmidt
 - + National Park Service – Photo Points
 - + NPS/Sul Ross State University – 4 study sites in Boquillas Canyon
- ✘ Aquatic Habitat/Communities
 - + TCEQ-NPS Aquatic invertebrates – Identification of samples needs funding
 - + Texas State University - Algae
 - + Riparian Vegetation /BioControl and management of invasive species.
- ✘ Reservoir Operations/Basin-wide analysis
- ✘ University of Texas - Physical Assessment Project

CONSERVATION AREA APPROACHES

- ✗ Land use, governance, ecological properties
- ✗ Partners
- ✗ Threats
- ✗ Strategies

THE LOWER COLORADO RIVER MULTI-SPECIES CONSERVATION PROGRAM (LCR MSCP)

- ✗ Balance the use of the Colorado River water resources with the conservation of native species and their habitats.
- ✗ 50 years
- ✗ 400+ miles
- ✗ 26 species
- ✗ 57 separate partners

METRICS – CONCEPTUAL MODEL APPROACH

Begin with critical elements & controlling factors

These are specific habitat conditions that...

- Are necessary or sufficient for the critical activities and processes to take place, or...
- Can interfere with these critical activities and processes

Add environmental conditions and dynamics that determine the abundance, spatial and temporal distribution, and quality of key habitat elements

These include natural and anthropogenic factors

Pesticide
Application

Mainstem
Water
Storage-
Delivery
Management

Fire Management

Grazing

Mechanical
Thinning

Planting
Regime

Nuisance Species
Introduction &
Management

*Local
Hydrology*

*Food
Availability*

Brood Size

Temperature

Humidity

*Patch
Size*

*Linear
Width*

*Community
Type*

*Understory
Density*

*Predator
Density*

*Canopy
Cover*

*Tree
Density*

*Matrix
Community*

*Anthropogenic
Disturbance*

*Patch
Phenology*

*Genetic
Diversity,
and
Infectious
Agents*

Foraging

Nest
Attendance

Nest Site
Selection

Molt

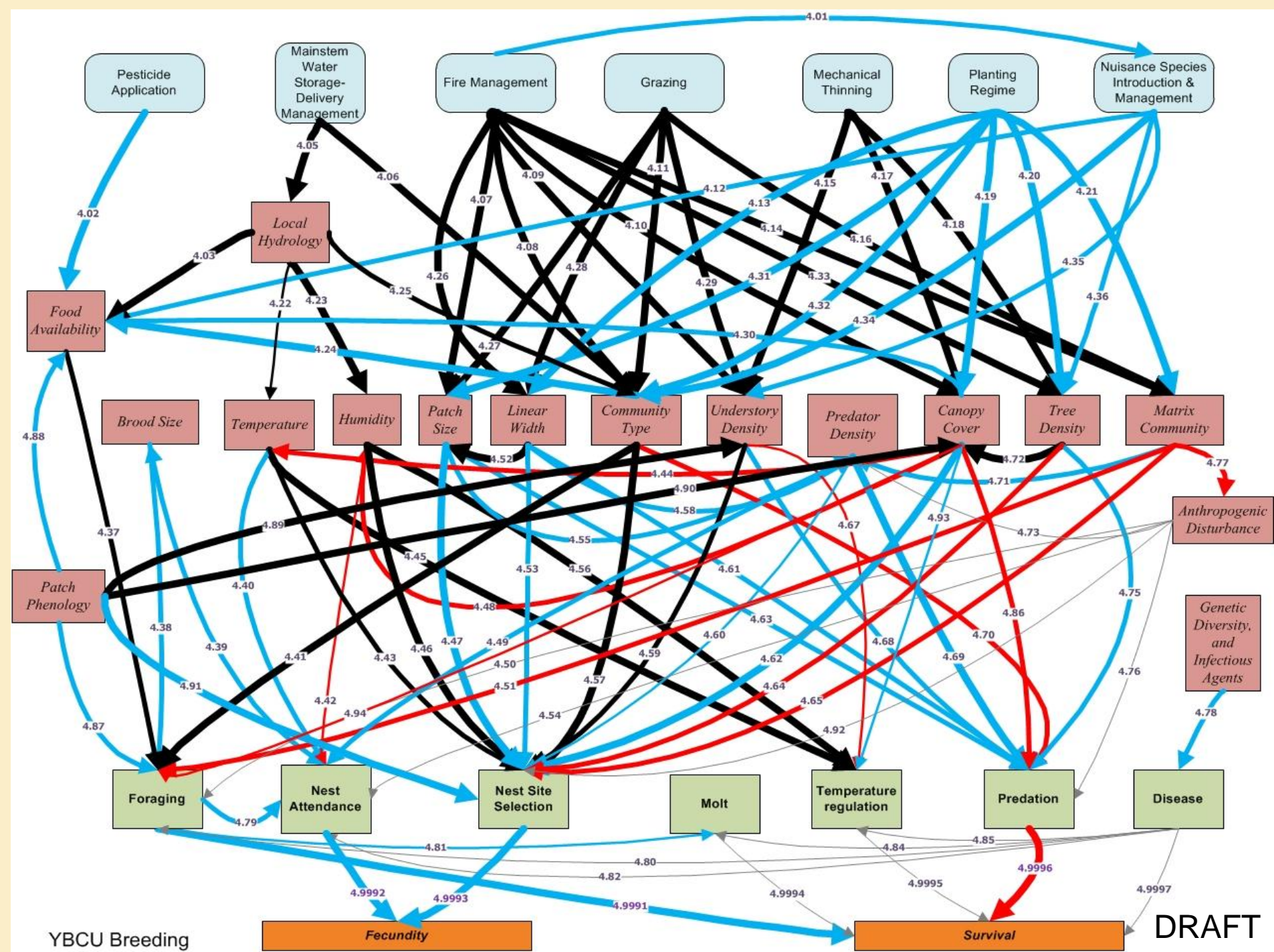
Temperature
regulation

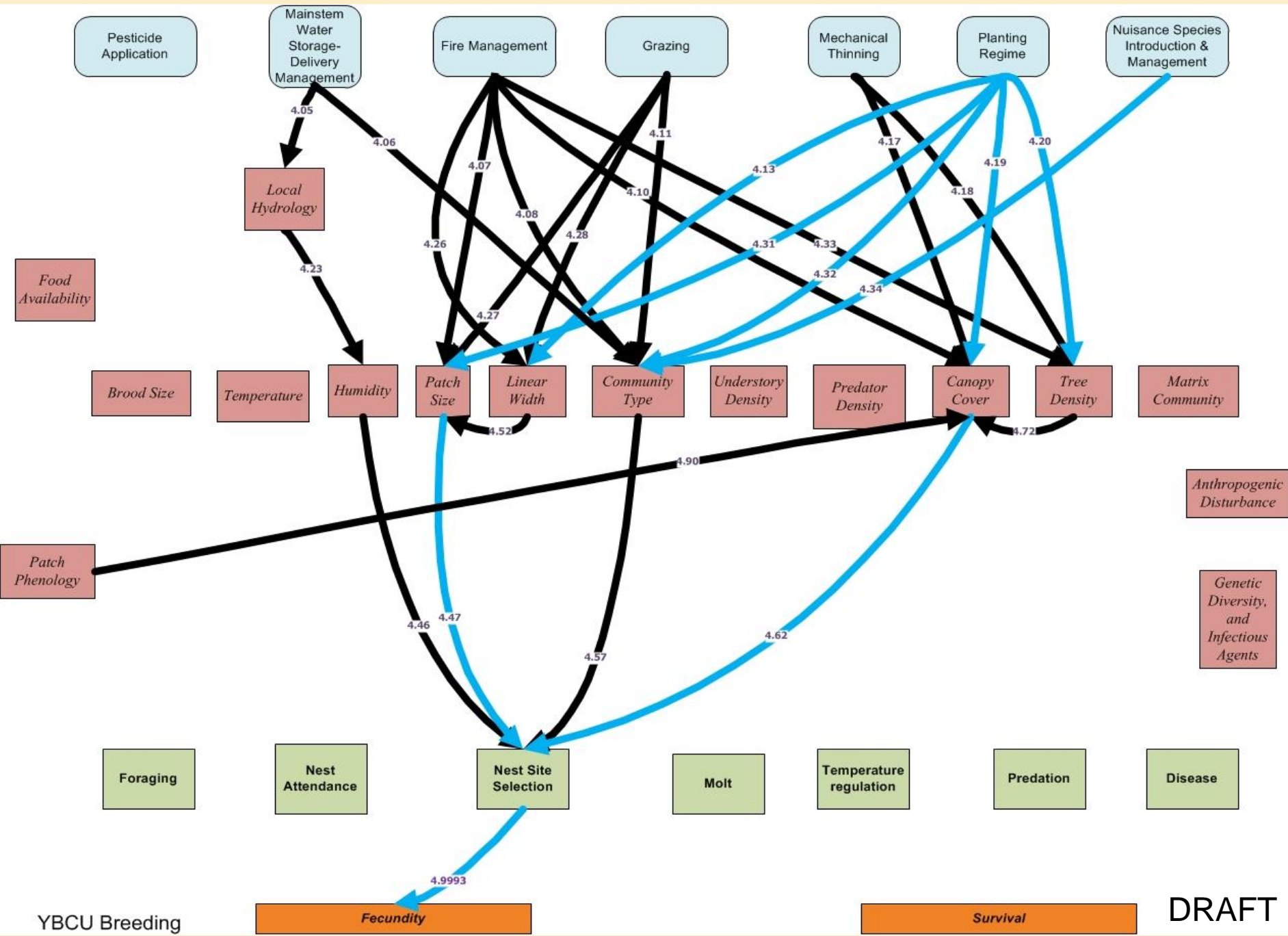
Predation

Disease

ADD CAUSAL RELATIONSHIPS

- ✗ Distribution, abundance, condition, or rate of affected node depends on distribution, abundance, condition, or rate of causal node
- ✗ Form “causal chains” and “webs”
- ✗ Identifies direct relationships





METRICS AND SCALING-UP

- ✗ Similar approaches but may take different avenues ...
- ✗ Require a knowledge of natural histories, landscape and historic context, ecological process and interactions - - and a framework to quantify the most important aspects
- ✗ Identify science needs
- ✗ Require monitoring

DISCUSSION -

✕ Thank you

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